

XIX. *Description of Peltophyllum, a new Genus of Plants allied to Triuris of Miers, with Remarks on their Affinities.* By GEORGE GARDNER, Esq., F.L.S., &c.

Read June 6th, 1843.

ABOUT two years ago, my friend Mr. Miers communicated to the Linnean Society the description of a new genus of plants from the Organ Mountains, to which he gave the name of *Triuris*. The affinities of the single species, of which he has given such excellent figures and details, appeared to him, as they well might, to be rather dubious, although at the same time he felt no hesitation in referring it to the Endogenous division of the vegetable kingdom. It is not a little curious, that, within a day or two of the time at which Mr. Miers presented his paper to be read, I should have found, at a distance of nearly 2000 miles from the Organ Mountains, a little plant closely allied to *Triuris*, and one whose structure enables us with little difficulty to refer them both to their true position among other plants.

The little plant found by me bears a very great resemblance in general appearance to that of Mr. Miers; but I think that there are sufficient grounds for considering it as belonging to a distinct genus. I unfortunately possess only pistilliferous plants. These, however, differ in their structure in several respects from that of *Triuris*. In the latter the perigonium has only three divisions, while in my plant there are six; and, moreover, they differ in their anatomical structure. I have before me, while I write, a segment of each, well moistened and placed side by side in the field of the microscope. They both terminate in a subulate tail-like extremity, and in æstivation these are in both instances involute, that is, folded up within the lower and broader portion of the segments. At the place where the folding in of the segment takes place in *Triuris*, there is externally an opening or pore, well represented by Mr. Miers at fig. 7. of the plate which illustrates his paper, and of the drawing which he has so obligingly executed to illustrate mine. This

tube seems to be formed by the folding backwards of the margins of the acuminate portion of the perigonium, and their subsequent union. In my plant nothing of this structure is to be seen; the tails are perfectly plain and continuous with the broader part; there are no pores, and the entire segment forms one uniform mass of cellular tissue, which in the mesial line is a little more dense, but not so much so as in *Triuris*; and the cells, like those of *Triuris*, present those unabsorbed cytoblasts or nuclei which are so well seen in *Cactææ* and *Orchideæ*. The pistilla, as in *Triuris*, are numerous; but in place of being subulate, are thickened a little towards their apices, and obliquely truncated.

Mr. Miers found no leaves in connexion with his plant. My specimens were found growing under some small trees, in a rather moist sandy situation, where there was but little herbaceous vegetation. Near each of the flower-bearing stems which were collected, I found also, within an inch or two of it, a most curious little leaf, the lamina of which is nearly orbicular, with an apiculus at what appears to be its apex, strongly reticulated, with the primary veins disposed very much like those of *Nelumbium speciosum*, or rather like those of some of the scandent species of *Cissampelos*, peltately borne upon a petiole about two inches long, or equal in height with the flowering stem; but from the hurried manner in which I was obliged to collect the few specimens I possess, I could not ascertain what was the underground connexion of the leaves and flower-stems, though it would have been a most important matter to have done so, if any such exists. These leaves are solitary, and arise eccentrically from a small fleshy tube, from the base of which proceed a few rootlets, somewhat pellucid, either glabrous, or covered with short villi. Nearly the lower half of the petiole is enveloped in a membranous longitudinally striated sheath, and this is again surrounded by the remains of two or three others of a similar nature. Now, as there is no tube at the base of the scape, and as the lower part of it, that is, the underground portion of it, takes something of a horizontal direction, and as the tube connected with the leaf does so also, it is very probable that they are connected with each other: at least this is more likely than to suppose that both the scape and the leaf arise from the same point but at different times. The nature of the sheaths, moreover, which surround the base of the petiole, so different from the few scales which exist at the bottom of the scape, is quite against the latter supposition. The scapes

of *Triuris*, also, which I possess, as well as the figures given by Mr. Miers, bear all the impress of the specimens having been broken from an underground rhizoma.

I shall now proceed to characterize this little plant more particularly, before making any remarks upon the affinities of it and *Triuris*. I have named it *Peltophyllum*, from the nature of its leaves.

PELTOPHYLLUM.

CHAR. GEN. *Flores* dioici. *Masc.* ignoti. *Fœm.* *Perigonium* 6-partitum, coloratum, patens, persistens; laciniis ovatis longè acuminatis; acumine plano. *Ovaria* plurima, in tori apice sessilia, adpressa, libera. *Styli* ad apicem incrassati, obliquè truncati. *Fructus* ignotus.

Herba *parvula Brasiliensis*. *Folia a scapo distantia, longè petiolata, peltata, valdè reticulata.* *Radix tuberosa, fibrosa.* *Scapus subramosus, basi squamosus; pedunculis basi bracteatis, unifloris; floribus luteis.*

1. *Peltophyllum luteum*, Gardn. Herb. Bras., n. 3570. TAB. XV.

Hab. In arenosis umbrosis humidis Provinciæ Goyazanæ, Brasiliæ. Martio florebat.

Descr. Herba dioica, subbipollicaris. *Folia a scapo distantia, e tubere parvulo fibroso erumpentia, petiolata, peltata, orbiculata, mucronata, integerrima, glabra, peltivenia; venis primariis marginem versus arcuatis; 8 lin. eireiter lata. Petioli subbipollicares, teretes, pellucidi, glabri, vaginis 3 membranaceis, acuminatis, glabris, 8-10 lin. longis, ad basin cincti. Scapi fœminei solitarii, subramosi, basi squamosi, subbipollicares. Pedunculi uniflori, 4 lin. longi, basi bracteati; bracteis ovatis, acutis, lineam longis. Perigonium 6-partitum, luteum, patens, persistens; laciniis ovatis longè acuminatis, æstivatione basi valvatis, acumine plano, ante anthesin gyrato incluso. Ovaria plurima, in tori apice sessilia, adpressa, libera. Styli sublaterales, ad apicem incrassati, obliquè truncati. Fructus ignotus.*

I have already contrasted the female flowers of this plant with those of *Triuris*; my not having found male ones prevents me from doing the same with them. It would be interesting to know the nature of the stamens; but from the great similarity of the two genera in other respects, we may conclude that they are not very different, so far as regards structure. What their number may be admits of greater doubts. In *Triuris* the segments of the perigonium are three; and we find the anthers to be three also, placed opposite the segments, although at first sight they appear to be alternate with them,

the great breadth of the connective separating the lobes of the one so much that they approximate those of the others in such a manner as to give them the appearance of belonging to the same anther. In *Peltophyllum*, the great probability is that there are six stamens, judging from the number of the divisions of the perigonium; as we generally find that in those natural orders in which this organ consists of six divisions, the stamens are six also. This is more particularly the case when the two whorls which constitute it are so closely united that they adhere by their margins, as, for example, in many of the genera of the natural order *Liliaceæ*. In *Pontederiaceæ* we find in the genus *Heteranthera* that the perigonium, although somewhat tubular, consists of two very distinct whorls, and there the stamens are three in number, placed opposite to the three inner segments; while in *Pontederia*, where the perigonium has the two whorls more blended into one, the six divisions have each a stamen placed opposite to them. Even in the same genus, where the whorls of the perigonium are upon the same plane, we find that the stamens follow the number of its divisions, as in *Paris*, where they both vary from eight to ten; and in *Smilacina*, where they vary from four to six.

Mr. Miers was inclined to place *Triuris* near to *Juncagineæ* or *Fluviales*, from some of the genera of these orders being occasionally diœcious; and from *Posidonia*, which belonged to the latter, having three approximate pairs of sessile anthers on a receptacle. In all other respects, however, these orders differ most essentially from *Triuris*. When I collected *Peltophyllum*, I was at that time inclined to consider it as nearly related to *Menispermaceæ*, from a hurried glance at the structure of its flowers, but more from the great resemblance which its leaves bear to those of some of the peltate-leaved species of *Cissampelos*. A more accurate examination of its structure, while it confirms the above analogy, inclines me to place it, and of course *Triuris*, along with *Smilaceæ*, and the other orders of that group, to which Dr. Lindley, in the second edition of his 'Introduction to the Natural System of Botany,' has given the name of *Retosæ*; and more recently, in his 'Elements of Botany,' that of *Dictyogens*. This group of plants forms evidently the bond of union between the *Endogenous* and *Exogenous* divisions of the vegetable kingdom; on the one hand, agreeing in their vegetation with the latter, and on the other, in their fructification with the former.

Menispermaceæ, among *Exogens*, is the order which most closely approximates to the *Dictyogenous* group. Dr. Lindley was the first to point out this affinity; and the more recent observations of himself and others have confirmed the relationship. To the group in which he places *Menispermaceæ*, he gives the name of *Homogens*. Besides this order, it contains *Aristolochiaceæ*, *Nepenthaceæ*, *Piperaceæ*, and some others, all of which agree in possessing a woody system of a remarkably homogeneous structure, having more the appearance of wedges than concentric circles. Formerly it was supposed that the Retose group, or *Dictyogens*, had no other character to separate them from the truly Endogenous orders than their reticulated leaves; but more recent observations have discovered characters to distinguish them, equal to those which separate the *Homogens* from the true *Cyclogens*, their rhizomas possessing a central pith, and their woody matter exhibiting the wedgelike bundles of *Homogens*. Among the truly Endogenous orders, we find that the *Dictyogens* claim closest kindred with *Liliaceæ* and *Amaryllidaceæ*.

If we compare the leaves of *Peltophyllum* with those of *Dioscoreaceæ* and *Smilaceæ*, we shall find that, like them, they are of a highly reticulated nature; and I have no doubt that *Triuris* will ultimately be found to possess leaves of a similar character: indeed, since Mr. Miers has seen my little plant, he feels satisfied that he had overlooked the leaves of his. The flowers of *Smilaceæ* and *Dioscoreaceæ* are diœcious like those of *Triuris* and *Peltophyllum*; and if we look at the stamens of *Ruscus*, they will be found to present considerable analogy to those of *Triuris*, as has already been pointed out by Mr. Miers in his paper. In *Ruscus* the stamens have their filaments connected into a cylindrical tube, while in *Triuris* they and the connective are so much enlarged and run together, that they form a large central fleshy mass.

Notwithstanding that the plants at present under consideration bear a greater resemblance to the orders of the *Dictyogenous* group than to those of any other, yet there are peculiarities of structure which forbid their being associated with either of them. Thus they are distinguished from *Smilaceæ* by their ovaries being free and numerous, not three and cohering; from *Dioscoreaceæ* by the same characters, and by their being inferior, not superior; from *Roxburghiaceæ* by their habit, diœcious flowers, and very numerous ovaries; while from all of them they are still further distinguished by their

extrorse anthers. From these considerations I propose to constitute a distinct order for the reception of these two genera, which will hold the same relation to the Syncarpous orders of *Dictyogens*, as *Menispermaceæ* does to those of *Homogens*; and which, in the mean time, may be thus characterized:—

TRIURACEÆ.

Herbæ parvulæ, perennes, rhizomate repente? *Folia* solitaria, a scapo distantia, longè petiolata, nervosa, integerrima. *Vaginæ* ad basin petiolorum membranaceæ. *Scapus* subramosus, basi squamosus. *Flores* regulares, dioici; pedicellis unifloris, bracteatis. *Perrigonium* corollinum, 3–6 partitum, patens, persistens, laciniis longè acuminatis, æstivatione basi valvatis, acumine interdum tubuloso, ante anthesin gyrate incluso. *Stamina* 3–6? *Antheræ* extrorsæ, loculis disjunctis, imo androphoro magno carnoso centrali insertæ. *Ovaria* plurima, in tori apice sessilia, adpressa, libera. *Ovula* in loculis solitaria? *Styli* sublaterales, subulati vel ad apicem incrassati et obliquè truncati. *Fructus* ignotus.

EXPLANATION OF TAB. XV.

Fig. 1 & 2. Scapes of *Peltophyllum luteum*, of the natural size.

3. A scape, magnified.
4. A leaf, of the natural size.
5. A carpel, magnified.
6. A segment of the flower, seen from without.
7. A representation of a segment of *Triuris hyalina*, in the expanded state, showing the entrance to the tube.
8. The same in its half-expanded state.

Glasgow, April 4th, 1843.